

# **AGRICULTURAL POWER SYSTEMS I**

## **Curriculum Content Framework**

*Prepared By*

Chris Adams, St. Joe  
Tommy Brown, Marvell  
Jerry Gilliam, Greene County Tech  
Mike Vines, DeQueen  
Jerry Yates, Centerpoint

*Facilitated By*

Karen Chisholm, Program Manager  
Office of Assessment and Curriculum  
Arkansas Department of Workforce Education

*Edited By*

Angela Collins, Program Advisor  
Office of Agricultural Science and Technology  
Arkansas Department of Workforce Education

*Disseminated By*

Career and Technical Education  
Office of Assessment and Curriculum  
Arkansas Department of Workforce Education

# Curriculum Content Framework

## AGRICULTURAL POWER SYSTEMS I

**Grade Levels:** 10, 11, 12  
**Course Code:** 491120

**Prerequisites:** Agriculture Science and Technology; Agriculture Mechanics I; Agriculture Mechanics II

Course Description: This course covers the basic principles of agricultural power (electrical and internal combustion), maintenance and repair of equipment, career opportunities, and safety.

### Table of Contents

|   | Page |
|---|------|
| Unit 1: Introduction to Agriculture Power Systems .....   | 1    |
| Unit 2: Safety Considerations in Agricultural Power ..... | 4    |
| Unit 3: Principles of Power .....                         | 6    |
| Unit 4: Fuel Systems .....                                | 8    |
| Unit 5: Engine Lubrication Systems .....                  | 12   |
| Unit 6: Cooling Systems .....                             | 15   |
| Unit 7: Electrical Systems.....                           | 18   |

# Unit 1: Introduction to Agriculture Power Systems

## 5 Hours

Terminology: Agricultural mechanics, Mechanization

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                              |  |
|--|-------------|--|------------------------------|--|
| Knowledge  | Application | Skill Group  | Skill                        | Description  |
| 1.1 Define terms   |             | Foundation   | Reading                      | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23]      |
| 1.2 Explain how power systems are important to agriculture           |             | Foundation   | Reading                      | Applies information to job performance [1.3.4]<br><br>Determines what information is needed [1.3.10] |
|  |             | Personal Management  | Organizational Effectiveness | Comprehends the organization's modes of operation [3.3.5]  |
|  |             | Thinking   | Creative Thinking            | Makes connections between seemingly unrelated ideas [4.1.6]  |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do                |   | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |   |   |
|---|---|--|---|---|
| Knowledge   | Application   | Skill Group  | Skill                                       | Description   |
| 1.3 Discuss career opportunities involving agricultural power systems and machinery | 1.3.1 Research a career in agricultural power and machinery to determine the training needed, working conditions, and pay scale | Foundation   | Reading                                     | Uses standard occupational resource materials [1.3.22]<br><br>Uses written sources (books, dictionaries, directories) to obtain factual information [1.3.23]                                      |
|   |   |  | Writing                                     | Organizes sentences into paragraphs [1.6.11]<br><br>Produces neat, legible document from typewriter or computer [1.6.15]  |
|   |   | Personal Management  | Career Awareness, Development, and Mobility | Explores career opportunities [3.1.6]<br><br>Identifies continuing changes in male/female roles at home and work [3.1.7]<br><br>Identifies education and training needed to achieve goals [3.1.8] |
|   |   | Thinking   | Knowing How To Learn                        | Uses available resources to acquire new skills or improve skills [4.3.4]<br><br>Processes new information as related to the workplace [4.3.5]   |

| <b>CAREER AND TECHNICAL SKILLS</b><br>What The Student Should Be Able To Do                          |             | <b>ACADEMIC AND WORKPLACE SKILLS</b><br>What The Instruction Should Reinforce |   |  |
|--|-------------|---|---|--|
| Knowledge  | Application | Skill Group   | Skill                                       | Description  |
| 1.4 Identify FFA activities and programs of interest to students in agricultural power and machinery |             | Foundation  | Listening                                   | Evaluates oral information/presentation [1.2.2]<br><br>Receives and interprets verbal messages [1.2.8]                               |
|  |             | Personal Management   | Career Awareness, Development, and Mobility | Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]  |
|  |             | Thinking  | Knowing How to Learn                        | Uses available resources to acquire new skills or improve skills [4.3.4]<br><br>Uses available resources to apply new skills [4.3.6] |

## Unit 2: Safety Considerations in Agricultural Power

### 5 Hours

Terminology: Decibel, Noise duration, Noise intensity

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do |   | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce |                              |   |
|--|---|--|------------------------------|---|
| Knowledge  | Application   | Skill Group  | Skill                        | Description   |
| 2.1 Define terms   |   | Foundation   | Reading                      | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23] |
| 2.2 Explain the hazards associated with agricultural power           |   | Foundation   | Reading                      | Applies information and concepts derived from printed materials [1.3.3]                         |
|  |   |  |                              | Determines what information is needed [1.3.10]  |
|  |   | Personal Management  | Organizational Effectiveness | Comprehends the organization's modes of operation [3.3.5]                                       |
| 2.3 Identify the safety colors used in the agriculture mechanics lab | 2.3.1 Inspect the agriculture mechanics lab to determine if proper safety colors are being used | Thinking   | Creative Thinking            | Develops visual aids to create audience interest [4.1.4]  |
|  |   | Foundation   | Listening                    | Listens to follow directions [1.2.6]  |
|  |   |  | Speaking                     | Asks questions to clarify information [1.5.3]   |
|  |   |  |                              | Communicates a thought, idea, or fact in spoken form [1.5.5]                                    |
|  |   | Personal Management  | Organizational Effectiveness | Applies knowledge to implement work-related system or practice [3.3.4]                          |
|  |   | Thinking   | Creative Thinking            | Combines ideas or information in a new way [4.1.2]  |

| <b>CAREER and TECHNICAL SKILLS</b><br>What the Student Should be Able to Do                                      |                    | <b>ACADEMIC and WORKPLACE SKILLS</b><br>What the Instruction Should Reinforce |                                 |  |
|--|--------------------|---|---------------------------------|--|
| <b>Knowledge</b>   | <b>Application</b> | <b>Skill Group</b>  | <b>Skill</b>                    | <b>Description</b>   |
| 2.4 Identify the classes of fire   |                    | Foundation  | Science                         | Applies life saving techniques [1.4.4]   |
| 2.5 Identify the types of fire extinguishers used in the agriculture mechanics and determine the use of each     |                    | Foundation  | Science                         | Applies life saving techniques [1.4.4]   |
|  |                    | Thinking  | Knowing How To Learn            | Applies knowledge and skills to identifying and using fire extinguishers for safety [4.3.1]  |
| 2.6 Discuss the proper clothing and equipment that should be used when working with agriculture power equipment. |                    | Foundation  | Speaking                        | Applies/Uses technical terms as appropriate to audience [1.5.2]<br><br>Organizes ideas and communicates oral messages to listeners [1.5.7] |
|  |                    | Personal Management   | Responsibility                  | Sets high standards for self in completion of a task [3.4.9]   |
|  |                    | Thinking  | Seeing Things in the Mind's Eye | Organizes and processes images – symbols, pictures, graphs, objects, etc. [4.6.2]  |

## Unit 3: Principles of Power

### 5 Hours

Terminology: Tachometer, Torque, Vacuum

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                 |   |
|--|-------------|--|---------------------------------|---|
| Knowledge  | Application | Skill Group  | Skill                           | Description   |
| 3.1 Define terms   |             | Foundation   | Reading                         | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23] |
| 3.2 Define units of work   |             | Foundation   | Arithmetic/<br>Mathematics      | Converts different units of measurement [1.1.17]  |
|  |             |  | Writing                         | Performs basic computations [1.1.31]<br><br>Uses technical words and symbols [1.6.20]           |
|  |             | Thinking   | Problem Solving                 | Demonstrates logical reasoning in reaching a conclusion [4.4.2]                                 |
| 3.3 Explain torque   |             | Foundation   | Speaking                        | Communicates a thought, idea, or fact in spoken form [1.5.5]                                    |
|  |             | Interpersonal  | Coaching                        | Pronounces words correctly [1.5.9]<br><br>Helps others learn new skills [2.1.3]                 |
|  |             | Thinking   | Seeing Things in the Mind's Eye | Visualizes a system's operation from schematics [4.6.3]   |



| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |   | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                   |   |
|--|---|--|-------------------|---|
| Knowledge  | Application   | Skill Group  | Skill             | Description   |
| 3.4 Identify the different types of power                            | 3.4.1 Solve problems associated with the different principles involved in power | Foundation   | Science           | Applies a scientific principle to solve a problem [1.4.8]<br><br>Constructs hypothesis [1.4.11] |
|  |   | Thinking   | Creative Thinking | Finds new ways of dealing with existing problems/situations [4.1.5]                             |
|  |   |  | Problem Solving   | Identifies possible reasons for problem [4.4.6]   |

## Unit 4: Fuel Systems

### 20 Hours

Terminology: Carburetor, Combustion, Fuel

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                   |   |
|--|-------------|--|-------------------|---|
| Knowledge  | Application | Skill Group  | Skill             | Description   |
| 4.1 Define terms   |             | Foundation   | Reading           | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23]                   |
| 4.2 Identify the different types of fuel used in agriculture         |             | Foundation   | Listening         | Listens to follow directions [1.2.6]  |
|  |             |  | Speaking          | Asks questions to clarify information [1.5.3]<br><br>Communicates a thought, idea, or fact in spoken form [1.5.5] |
|  |             | Personal Management  | Organizational    | Applies knowledge to implement work-related system or practice [3.3.4]  |
|  |             | Thinking   | Creative Thinking | Combines ideas or information in new way [4.1.2]  |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                 |   |
|--|-------------|--|-----------------|---|
| Knowledge  | Application | Skill Group  | Skill           | Description   |
| 4.3 Distinguish between different grades of fuel                     |             | Foundation   | Writing         | Records data [1.6.16]<br><br>Writes appropriate entries [1.6.22]<br><br>Writes/prints legibly [1.6.24]      |
|  |             | Thinking   | Decision Making | Evaluates information/data to make best decision [4.2.5]  |
|  |             |  | Reasoning       | Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3]         |
| 4.4 List safety precautions involved in handling and storing fuels   |             | Foundation   | Science         | Follows safety guidelines [1.4.16]  |
|  |             | Personal Management  | Responsibility  | Pays close attention to details [3.4.8]<br><br>Sets high standards for self in completion of a task [3.4.9] |
|  |             | Interpersonal  | Coaching        | Encourages others to develop personal and professional skills [2.1.2]                                       |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |  | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                |  |
|--|--|--|--------------------------------|--|
| Knowledge  | Application  | Skill Group  | Skill                          | Description  |
| 4.5 List the steps in cleaning and replacing carburetors             | 4.5.1 Demonstrate steps in cleaning and replacing a carburetor | Foundation   | Writing                        | Summarizes written information [1.6.17]  |
|  |  | Personal Management  | Responsibility                 | Exhibits enthusiasm in approaching and completing tasks [3.4.3]<br><br>Pays close attention to details [3.4.8]                       |
|  |  | Thinking   | Knowing How to Learn           | Uses available resources to acquire new skills or improve skills [4.3.4]<br><br>Uses available resources to apply new skills [4.3.6] |
| 4.6 List the steps taken when replacing fuel filters                 | 4.6.1 Replace a fuel filter                                    | Foundation   | Writing                        | Uses technical words and symbols [1.6.20]<br><br>Writes logical and understandable sentences [1.6.23]                                |
|  |  | Personal Management  | Integrity/ Honesty/ Work Ethic | Follows established rules, regulations, and policies [3.2.5]   |
|  |  | Thinking   | Creative Thinking              | Finds new ways of dealing with existing problems/situations [4.1.5]  |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do                |   | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                |   |
|---|---|--|--------------------------------|---|
| Knowledge   | Application                               | Skill Group  | Skill                          | Description   |
| 4.7 Explain the steps to be performed in bleeding the air from a diesel fuel system | 4.7.1 Bleed air from a diesel fuel system | Foundation   | Speaking                       | Responds to listener feedback [1.5.10]<br><br>Uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and the occasion [1.5.14] |
|   |   | Personal Management  | Integrity/ Honesty/ Work Ethic | Follows established rules, regulations, and policies [3.2.5]  |
|   |   | Thinking   | Problem Solving                | Draws conclusions from observations, evaluates conditions, and gives possible solutions [4.4.5]<br><br>Recognizes/Defines problem [4.4.8]   |

## Unit 5: Engine Lubrication Systems 20 Hours

Terminology: SAE, Viscosity

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                      |   |
|--|-------------|--|----------------------|---|
| Knowledge  | Application | Skill Group  | Skill                | Description   |
| 5.1 Define terms   |             | Foundation   | Reading              | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23]             |
| 5.2 Identify different kinds of oil and oil additives                |             | Foundation   | Reading              | Identifies relevant details, facts, and specifications [1.3.16]   |
|  |             |  |                      | Locates pertinent information in documents such as manuals, graphs, and schedules to perform tasks [1.3.18] |
|  |             |  | Thinking             | Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]                   |
|  |             |  | Knowing How to Learn |   |
|  |             |  | Problem Solving      | Recognizes/Defines problem [4.4.8]  |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do  |                             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                 |   |
|---|-----------------------------|--|---------------------------------|---|
| Knowledge   | Application                 | Skill Group  | Skill                           | Description   |
| 5.3 Describe oil system functions, including circulating splash, internal force feed splash, and full internal force feed |                             | Foundation   | Science                         | Applies scientific principles related to oil system functions [1.4.5]             |
|   |                             | Interpersonal  | Coaching                        | Helps others learn new skills [2.1.3]   |
|   |                             | Thinking   | Seeing Things in the Mind's Eye | Organizes and processes images - symbols, pictures, graphs, objects, etc. [4.6.2] |
|   |                             |  |                                 | Visualizes a system's operation from schematics [4.6.3]                           |
| 5.4 List the steps involved in changing oil   | 5.4.1 Change oil and filter | Foundation   | Science                         | Follows safety guidelines [1.4.16]  |
|   |                             | Interpersonal  | Coaching                        | Encourages others to develop personal and professional skills [2.1.2]             |
|   |                             | Personal Management  | Integrity/ Honesty/ Work Ethic  | Complies with safety and health rules in a given work environment [3.2.2]         |
|   |                             |  |                                 | Describes desirable worker characteristics [3.2.3]                                |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do      |  | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                |   |
|---|--|--|--------------------------------|---|
| Knowledge   | Application  | Skill Group  | Skill                          | Description   |
| 5.5 Explain the process of cleaning and replacing the crank case breather | 5.5.1 Demonstrate the ability to clean and replace a crank case breather | Foundation   | Speaking                       | Applies/Uses technical terms as appropriate to audience [1.5.2]<br><br>Organizes ideas and communicates oral messages to listeners [1.5.7]  |
|   |  | Personal Management  | Integrity/ Honesty/ Work Ethic | Follows established rules, regulations, and policies [3.2.5]  |
|   |  | Thinking   | Knowing How to Learn           | Processes new information as related to workplace [4.3.5]   |
| 5.6 Discuss the importance of the oil pressure regulating valves          | 5.6.1 Test lubrication system pressure                                   | Foundation   | Listening                      | Listens to follow directions [1.2.6]<br><br>Responds nonverbally to communication [1.2.9]   |
|   |  | Personal Management  | Responsibility                 | Exhibits enthusiasm in approaching and completing tasks [3.4.3]<br><br>Exerts a high level of effort and perseverance towards goal attainment [3.4.4]<br><br>Sets high standards for self in completion of a task [3.4.9] |
|   |  | Thinking   | Problem Solving                | Identifies possible reasons for problem [4.4.6]<br><br>Recognizes/Defines problem [4.4.8]   |



## Unit 6: Cooling Systems

### 20 Hours

Terminology: Cavitation erosion, Hydrometer, Permanent antifreeze

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |   | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                |  |
|--|---|--|--------------------------------|--|
| Knowledge  | Application   | Skill Group  | Skill                          | Description  |
| 6.1 Define terms   |   | Foundation   | Reading                        | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23]                                      |
| 6.2 Identify cooling system parts and their functions                | 6.2.1 Check coolant level                                       | Foundation   | Speaking                       | Asks questions to clarify information [1.5.3]<br><br>Pronounces words correctly [1.5.9]  |
|  |   | Personal Management  | Integrity/ Honesty/ Work Ethic | Complies with safety and health rules in a given work environment [3.2.2]  |
|  |   | Thinking   | Problem Solving                | Draws conclusions from what is read and gives possible solutions [4.4.5]   |
| 6.3 Explain the process of draining and replacing coolant            | 6.3.1 Demonstrate the process of draining and replacing coolant | Foundation   | Speaking                       | Applies/Uses technical terms as appropriate to audience [1.5.2]  |
|  |   | Interpersonal  | Coaching                       | Helps others learn new skills [2.1.3]  |
|  |   | Thinking   | Knowing How to Learn           | Uses available resources to acquire new skills or improve skills [4.3.4]<br><br>Uses available resources to apply new skills [4.3.6] |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |  | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                 |   |
|--|--|--|-----------------|---|
| Knowledge  | Application                              | Skill Group  | Skill           | Description   |
| 6.4 Discuss the role of the fan belt in the cooling system           | 6.4.1 Adjust fan belt tension            | Foundation   | Reading         | Analyzes and applies what has been read to a specific task [1.3.2]  |
|  |  | Personal Management  | Responsibility  | Follows written directions [1.3.13]   |
|  |  | Thinking   | Decision Making | Maintains a high level of concentration in completion of a task [3.4.7]<br>Pays close attention to details [3.4.8]<br>Comprehends ideas and concepts related to cooling systems [4.2.2] |
| 6.5 List the steps involved in replacing the thermostat              | 6.5.1 Change a cooling system thermostat | Foundation   | Reading         | Reads and follows instructions to operate technical equipment [1.3.19]  |
|  |  | Personal Management  | Responsibility  | Exerts a high level of effort and perseverance towards goal attainment [3.4.4]  |
|  |  | Thinking   | Problem Solving | Demonstrates logical reasoning in reaching a conclusion [4.4.2]<br>Recognizes/Defines problem [4.4.8]   |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |                                | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                 |   |
|--|--------------------------------|--|-----------------|---|
| Knowledge  | Application                    | Skill Group  | Skill           | Description   |
| 6.6 Identify the possible problems to check for in cooling hoses     | 6.6.1 Replace hoses and clamps | Foundation   | Writing         | Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]       |
|  |                                |  |                 | Uses technical words and symbols [1.6.20]   |
|  |                                | Thinking   | Decision Making | Generates options/alternatives [4.2.6]  |
|  |                                |  | Problem Solving | Draws conclusions from observations, evaluates conditions, and gives possible solutions [4.4.5] |
|  |                                |  |                 | Interprets drawings to solve design problems [4.4.7]  |

## Unit 7: Electrical Systems

### 15 Hours

Terminology: Alternator, Battery, Spark plug

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do          |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                 |  |
|---|-------------|--|-----------------|--|
| Knowledge   | Application | Skill Group  | Skill           | Description  |
| 7.1 Define terms  |             | Foundation   | Reading         | Uses written resources(books, dictionaries, directories) to obtain factual information [1.3.23]  |
| 7.2 Identify the major components of an electrical system and their functions |             | Foundation   | Reading         | Interprets drawings to obtain factual information [1.3.17]                                       |
|   |             | Thinking   |                 | Uses written resources (books, dictionaries, directories) to obtain factual information [1.3.23] |
|   |             |  | Problem Solving | Interprets drawings to solve design problems [4.4.7]   |
|   |             |  | Reasoning       | Sees relationship between two or more ideas, objects, or situations [4.5.5]                      |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                 |  |
|--|-------------|--|---------------------------------|--|
| Knowledge  | Application | Skill Group  | Skill                           | Description  |
| 7.3 Describe the basic circuits of an electrical system              |             | Foundation   | Speaking                        | Applies/Uses technical terms as appropriate to audience [1.5.2]<br><br>Participates in conversation, discussion, and group presentations [1.5.8] |
|  |             |  | Writing                         | Writes appropriate entries [1.6.22]<br><br>Writes/prints legibly [1.6.24]  |
|  |             | Thinking   | Creative Thinking               | Makes connections between seemingly unrelated ideas [4.1.6]  |
| 7.4 Diagram the starting circuit                                     |             | Foundation   | Writing                         | Organizes information into an appropriate format [1.6.10]<br><br>Uses technical words and symbols [1.6.20]                                       |
|  |             | Thinking   | Creative Thinking               | Applies personal style to a drawing [4.1.11]   |
|  |             |  | Knowing How to Learn            | Develops personal learning strategies -- note taking, clustering related items, flash cards, etc. [4.3.2]  |
|  |             |  | Problem Solving                 | Interprets drawings to solve design problems [4.4.7]   |
|  |             |  | Seeing Things in the Mind's Eye | Organizes and processes images -- symbols, pictures, graphs, objects, etc. [4.6.2]   |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |             | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                |  |
|--|-------------|--|----------------|--|
| Knowledge  | Application | Skill Group  | Skill          | Description  |
| 7.5 Explain how the ignition circuit works                           |             | Foundation   | Speaking       | Organizes and communicates oral messages to listeners [1.5.7]<br><br>Pronounces words correctly [1.5.9]                                |
|  |             | Personal Management  | Responsibility | Maintains a high level of concentration in completion of a task [3.4.7]<br><br>Pays close attention to details [3.4.8]                 |
|  |             | Thinking   | Reasoning      | Extracts rules or principles from written information [4.5.4]<br><br>Uses logic to draw conclusions from available information [4.5.6] |

| CAREER AND TECHNICAL SKILLS<br>What The Student Should Be Able To Do |  | ACADEMIC AND WORKPLACE SKILLS<br>What The Instruction Should Reinforce |                                |  |
|--|--|--|--------------------------------|--|
| Knowledge  | Application  | Skill Group  | Skill                          | Description  |
| 7.6 Diagram the basic charging units                                 | 7.6.1 Demonstrate the ability to service the ignition system, and to set the timing of an engine | Foundation   | Writing                        | Prepares a complex document in a concise manner [1.6.12]<br><br>Uses technical words and symbols [1.6.20]                                      |
|  |  | Interpersonal  | Coaching                       | Encourages others to develop personal and professional skills [2.1.2]<br><br>Helps others learn new skills [2.1.3]                             |
|  |  | Personal Management  | Integrity/ Honesty/ Work Ethic | Complies with safety and health rules in a given work environment [3.2.2.]<br><br>Follows established rules, regulations, and policies [3.2.5] |

# **Glossary**

## **Unit 1: Introduction to Agricultural Power Systems**

1. Agricultural mechanics – the selection, operation, maintenance, service, sale, and use of power units, machinery, equipment, structures, and utilities in agriculture
2. Mechanization – the efficient use of machines to assist in all areas of production, processing and marketing



## **Unit 2: Safety Considerations in Agricultural Power**

1. Decibel – standard unit of sound
2. Noise duration – the length of time a person is exposed to a sound
3. Noise intensity – energy in sound waves

## **Unit 3: Principles of Power**

1. Tachometer – a device for measuring the rotating speeds of objects
2. Torque – a twisting force; the turning effect of a force
3. Vacuum – the absence of atmospheric pressure

## **Unit 4: Fuel Systems**

1. Carburetor – provides fuel and air to the engine in appropriate portions and volumes
2. Combustion – the act of burning
3. Fuel – any material that will burn

## **Unit 5: Engine Lubrication Systems**

1. SAE – Society of Automotive Engineers
2. Viscosity – tendency to flow

## Unit 6: Cooling Systems

1. Cavitation erosion – the eroding action caused by repeated collapsing or bursting of tiny vapor bubbles on the coolant side of the cylinder wall or sleeve
2. Hydrometer – an instrument for measuring the antifreeze concentration in coolant to determine the temperature of lowest protection against freeze-up
3. Permanent antifreeze – refers only to the type of antifreeze solution that will not boil away at normal engine temperatures. It does not mean antifreezes never wear out or does not need changing.

## **Unit 7: Electrical Systems**

1. Alternator – the engine component that keeps the battery fully charged
2. Battery – the electrical storage component of an engine
3. Spark plug – a device that transfers a spark from the outside of the engine to the inside of the engine